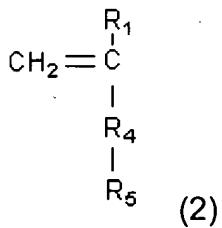
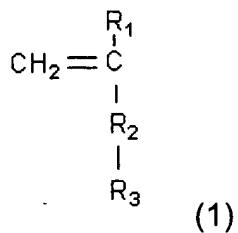


WHAT IS CLAIMED IS:

1. A monomer for a chemically amplified negative photoresist, which is represented by the formula 1 or 2:

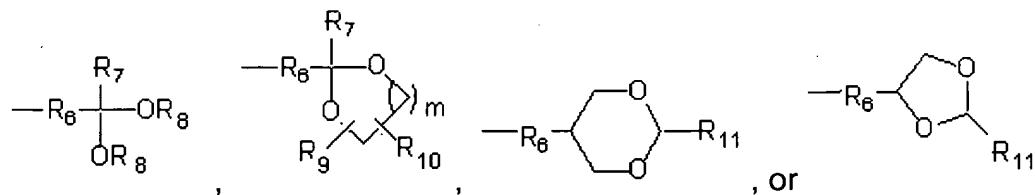


wherein:

R₁ is H or CH₃;

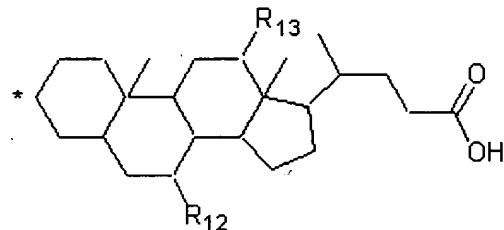
R₂ and R₄ are each independently selected from (R)_α(CH₂)_βR' and (R)_α[(CH₂)_γO]_δR' (wherein R is CO, CO₂, O, OCO, or OCO₂, R' is O, CO₂, or OCO₂, α is 0 or 1, β is 0 to 5, γ is 1 or 2, and δ is 1 to 5);

R₃ is represented by one of the formula:



wherein R₆, which combines an acetal compound and a vinyl compound, is a C₁-C₅ saturated alkyl, a C₁-C₅ ether, or a C₁-C₅ carbonyl; R₃ to R₇ are each independently selected from H, C₁-C₅ saturated alkyls, C₁-C₅ ethers, C₁-C₅ carbonyl groups, and C₁-C₅ alcohol groups; and m is a number ranging from 1-5; and

R₅ is represented by the formula:



wherein R₁₂ and R₁₃ are identical or each independently H or OH; and

* represents the bonding site at which the R₄ group is bonded.

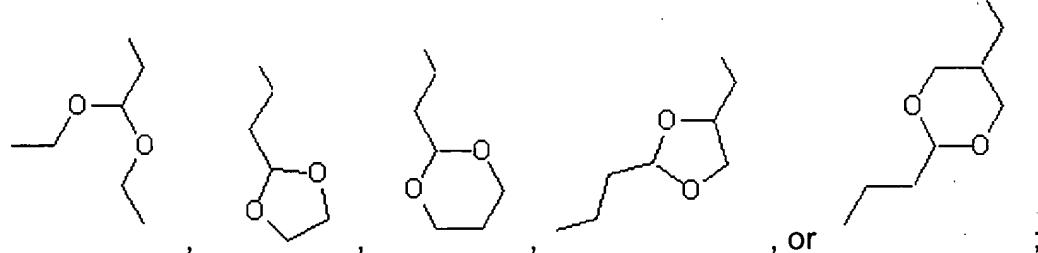
5 2. The monomer for a chemically amplified negative photoresist according

to claim 1 wherein:

R₁ is H;

R₂ is CO₂;

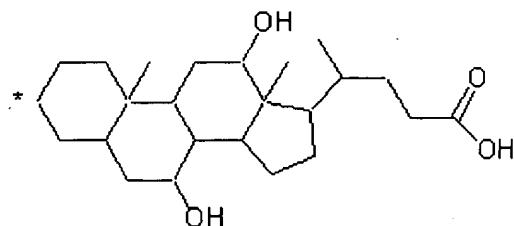
R₃ is



10

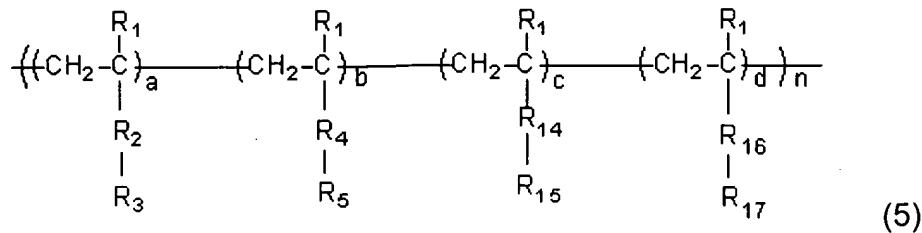
R₄ is CO₂; and

R₅ is



15

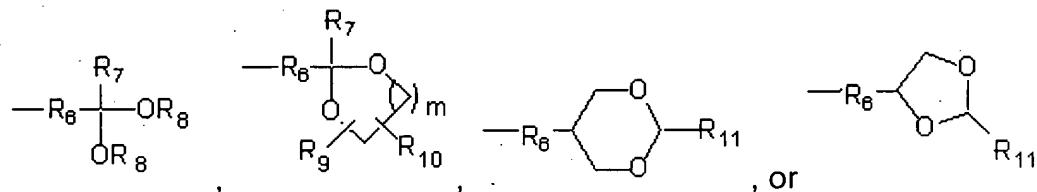
3. A polymer for a chemically amplified negative photoresist, which is represented by formula 5:



wherein R_1 is H or CH_3 ;

R_2 and R_4 are each independently selected from $(\text{R})_\alpha(\text{CH}_2)_\beta\text{R}'$ and $(\text{R})_\alpha[(\text{CH}_2)_\gamma\text{O}]_\delta\text{R}'$ (wherein, R is CO, CO_2 , O, OCO , or OCO_2 , R' is O, CO_2 , or OCO_2 , α is 0 or 1, β is 0 to 5, γ is 1 or 2, and δ is 1 to 5);

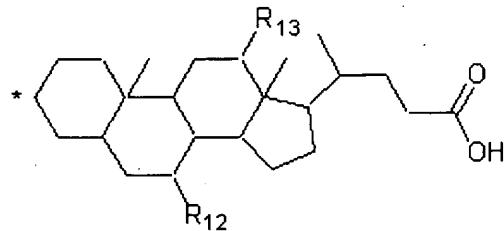
R_3 is represented by one of the formula:



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wherein R_6 , which combines an acetal compound and a vinyl compound, is a $\text{C}_1\text{-}\text{C}_5$ saturated alkyl, a $\text{C}_1\text{-}\text{C}_5$ ether, or a $\text{C}_1\text{-}\text{C}_5$ carbonyl; R_7 to R_{11} are each independently selected from H, $\text{C}_1\text{-}\text{C}_5$ saturated alkyls, $\text{C}_1\text{-}\text{C}_5$ ethers, $\text{C}_1\text{-}\text{C}_5$ carbonyl groups, $\text{C}_1\text{-}\text{C}_5$ alcohol groups; and m is a number ranging from 1-5; and

R_5 is represented by formula:



wherein R_{12} and R_{13} are each independently selected from H and OH,

15 and

* represents the bonding site at which the R_4 group is bonded;

R₁₄ and R₁₆ are each independently selected from a single bond, (R)_α(CH₂)_βR' and (R)_α[(CH₂)_γ O]_δR' (wherein R is CO, CO₂, O, OCO, or OCO₂, R' is O, CO₂, or OCO₂, α is 0 or 1, β is 0 to 5, γ is 1 or 2, and δ is 1 to 5); R₁₅ is a hydroxyl group; R₁₇ is a carboxyl group;

5 a, b, c, and d represent mole ratios of each monomer, a has a value of 0-0.5, b has a value of 0-0.9, c has a value of 0-0.3, and d has a value of 0-0.3, provided that a+b+c+d = 1; and

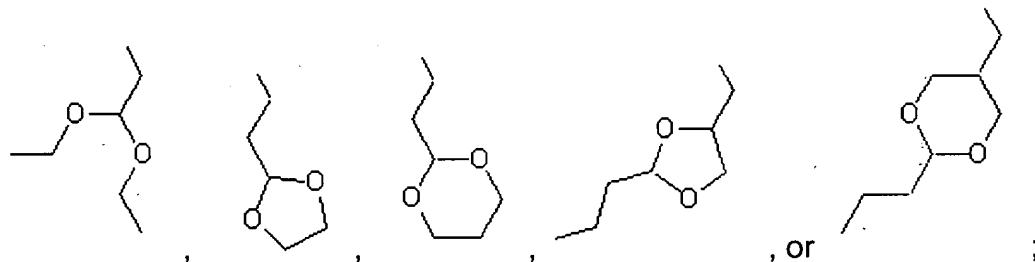
n represents the degree of polymerization of each polymer, and has a value of at least 2.

10 4. The polymer for a chemically amplified negative photoresist according to claim 3 wherein:

R₁ is H;

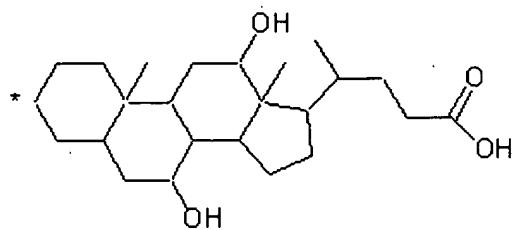
R₂ is CO₂;

R₃ is



R₄ is CO₂;

R₅ is



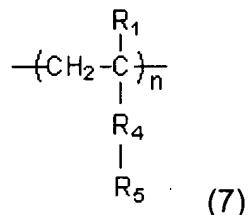
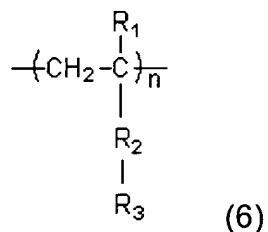
R₁₄ is CO₂CH₂CH₂,

R₁₅ is OH,

R₁₆ is a single bond, and

R₁₇ is COOH.

5 5. A chemically amplified negative photoresist composition comprising:
 a photoacid generator; and
 a homopolymer of the formula 6, a homopolymer of the formula 7, or a
 combination thereof;

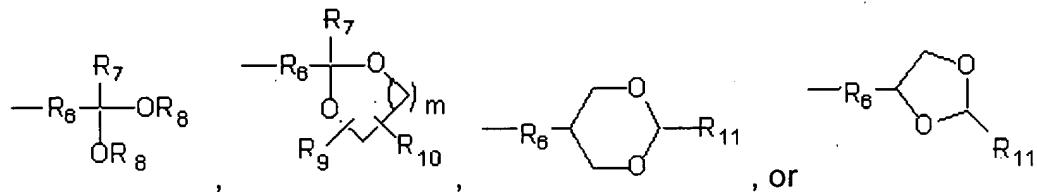


wherein R₁ is H or CH₃;

R₂ and R₄ are each independently selected from (R)_α(CH₂)_βR' and (R)_α[(CH₂)_γ

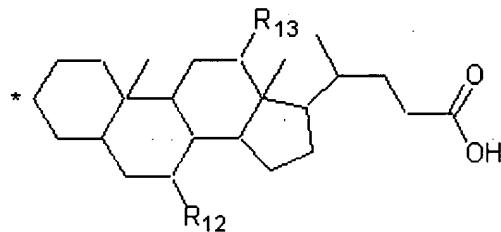
15 O]_δR' (wherein R is CO, CO₂, O, OCO, or OCO₂, R' is O, CO₂, or OCO₂, α is 0 or 1, β is
 0 to 5, γ is 1 or 2, and δ is 1 to 5);

R₃ is represented by one of the formula:



wherein R₆, which combines an acetal compound and a vinyl compound, is a C₁-C₅ saturated alkyl, a C₁-C₅ ether, or a C₁-C₅ carbonyl; R₇ to R₁₁ are each independently selected from H, C₁-C₅ saturated alkyls, C₁-C₅ ethers, C₁-C₅ carbonyl groups, and C₁-C₅ alcohol groups; and m is a number ranging from 1-5; and

R₅ is represented by the formula:



wherein R₁₂ and R₁₃ are each independently H or OH;

* represents the bonding site at which the R₄ group is bonded; and

n represents the degree of polymerization of each polymer, and has a value of at least 2.

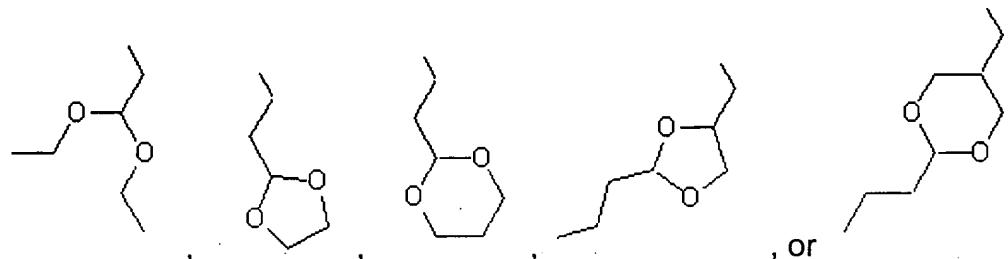
6. The chemically amplified negative photoresist composition according to claim 5 wherein the photoresist composition comprises a combination of the homopolymer of the formula 6 and the homopolymer of the formula 7.

7. The composition for a chemically amplified negative photoresist according to claim 5 wherein:

R₁ is H;

R₂ is CO₂;

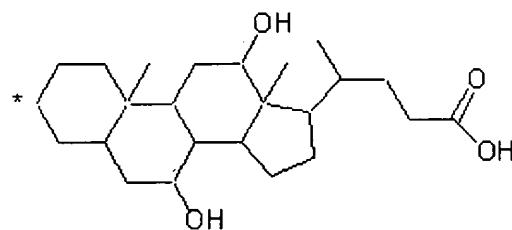
R₃ is



, or

R₄ is CO₂;

R₅ is



5

R₁₄ is CO₂CH₂CH₂,

R₁₅ is OH,

R₁₆ is a single bond, and

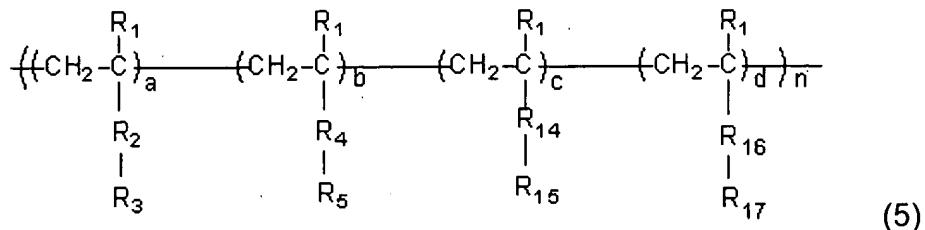
R₁₇ is COOH.

10

8. The chemically amplified negative photoresist composition according to claim 5 wherein the photoresist composition comprises 10 to 20 wt.% of the polymer and 0.1 to 1.0 wt.% of the photoacid generator based on the weight of the photoresist.

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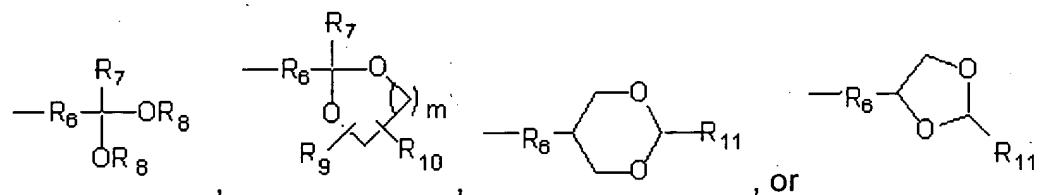
9. A chemically amplified negative photoresist composition comprising;
a photoacid generator; and
a polymer of formula 5:



wherein R₁ is H or CH₃;

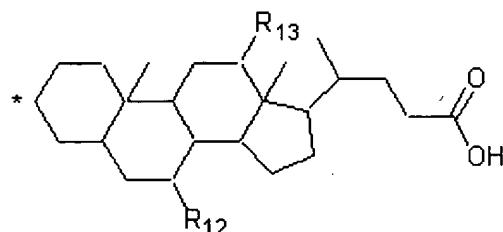
R₂ and R₄ are each independently selected from (R)_α(CH₂)_βR' and (R)_α[(CH₂)_γO]_δR' (wherein, R is CO, CO₂, O, OCO, or OCO₂, R' is O, CO₂, or OCO₂, α is 0 or 1, β is 0 to 5, γ is 1 or 2, and δ is 1 to 5);

R₃ is represented by one of the formula:



wherein R₆, which combines an acetal compound and a vinyl compound, is a C₁-C₅ saturated alkyl, a C₁-C₅ ether, or a C₁-C₅ carbonyl; R₇ to R₁₁ are each independently selected from H, C₁-C₅ saturated alkyls, C₁-C₅ ethers, C₁-C₅ carbonyl groups, and C₁-C₅ alcohol groups; and m is a number ranging from 1-5; and

R₅ is represented by the formula:



wherein R₁₂ and R₁₃ are each independently H or OH; and

* represents the bonding site at which the R₄ group is bonded;

R_{14} and R_{16} are each independently selected from a single bond, $(R)_\alpha(CH_2)_\beta R'$ and $(R)_\alpha[(CH_2)_\gamma O]_\delta R'$ (wherein R is CO, CO₂, O, OCO, or OCO₂, R' is O, CO₂, or OCO₂, α is 0 or 1, β is 0 to 5, γ is 1 or 2, and δ is 1 to 5); R_{15} is a hydroxyl group; R_{17} is a carboxyl group;

5 a, b, c, and d represent the mole ratios of each monomer, wherein a has a value of 0-0.5, b has a value of 0-0.9, c has a value of 0-0.3, and d has a value of 0-0.3, provided that $a+b+c+d = 1$; and

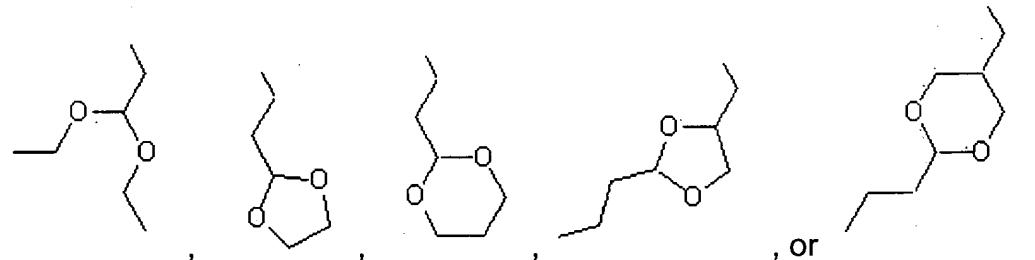
n represents the degree of polymerization of each polymer, and has a value of at least 2.

10 10. The chemically amplified negative photoresist composition according to claim 9 wherein

R_1 is H;

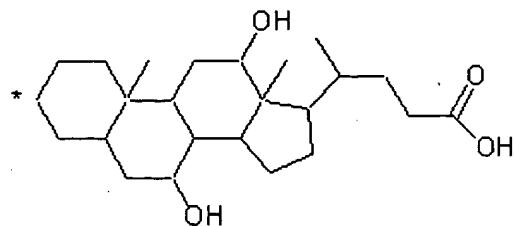
R_2 is CO₂;

R_3 is



R_4 is CO₂;

R_5 is



R_{14} is $CO_2CH_2CH_2$,

R_{15} is OH,

R_{16} is a single bond, and

5

11. The chemically amplified negative photoresist composition according to claim 9 wherein the photoresist composition comprises 10 to 20 wt.% of said polymer and 0.1 to 1.0 wt.% of said photoacid generator.